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ABSTRACT

Relationships such as caretaker-child, therapist-client, and teacher-student can be considered to be expert-novice interactions. In these relationships there is a complementarity between differential constraining of information by an expert and progressive empowerment towards learning of the novice. The expert organizes information for the novice so that the novice can assimilate the knowledge of the expert. The extent of expert-influenced learning by a novice depends on the expert, the novice, and the organization of their interaction. Characterizing teacher-student interactions as emerging, complementary, and dynamic processes emphasizes the importance of constraining in knowledge acquisition. Reconceptualizing interactions between teachers and students in terms of constraining enriches both research and instructional strategy. This approach emphasizes the joint interaction of teachers and students, rather than the individual actions of either. (ABL)

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# Organization of Teacher-Student Interaction: Differential Constraining Progressive Empowerment

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Running Head: INTERACTION

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One way to understand teacher-student interactions is to look at other interactions which have similarities. It is our observation that interactions between caretakers and children, as well as those between therapists and clients have organizational properties in common with interactions between teachers and students. Since all are organized around the goal of conveying information to the novice, and all share characteristics of joint action, they all generically can be considered expert-novice interactions. In each relationship there is a complementarity between differential constraining of information by an expert and progressive empowerment towards learning of the novice. In other words, the expert attempts to organize information for the novice such that the novice can begin to "own" the knowledge of the expert.

In this paper, I will be combining Vygotsky's (1978) notion of the zone of proximal development with ideas which have emerged in the study of other expert-novice interactions. In particular, I will support the claim that organization of interpersonal interactions emerges from the joint interaction of both parties rather than the individual qualities of either participant.

Briefly, an individual's zone of proximal development is the distance between a person's level of functioning independently and their level of functioning with support, usually support from an expert. For example, a student may not be able to do a math derivation independently, although independent completion of a derivation would be an eventual goal. Given that the student could follow a discussion of derivations by the teacher, and that the teacher decides to further explain derivation by working some problems on the board, this could be an optimal learning situation for the student.

Typically, teachers adjust instruction for students based on their perception of student need. As Vygotsky points out, however, teachers generally have not appreciated that two students who test at the same level do not necessarily have similar zones of proximal development. Since no two students have the same zone of proximal development, it is our claim that similarity across expert-novice interactions of varying types offers important information about the organization of interaction. To simply speak of expert instructional strategies, for example, ignores the co-action implicit in instruction. Both the teacher and the student are involved in the organization of a teaching/learning interaction. How the teacher teaches influences how the student learns influences how the teacher teaches, etc.

The teacher-student interaction is dynamic and organized. The interaction is dynamic because the processes which characterize the transfer/learning of knowledge shift as the novice becomes empowered. For example, what you do to organize your work with a research assistant changes as a function of your perception that the assistant needs more or less detailed instructions to follow through accurately on a task. As you work closely with the assistant, you know what is able to be assumed and what still needs more explanation. In all cases of expert-novice interaction, as the novice takes on more ability to be responsible for learning, the expert no longer needs to exercise as many constraints for the novice. That is, initiation of constraints for learning passes from expert to novice. The expert's attempt to differentially constrain available information is the complement to the progressive empowerment of the novice. There is a shift from external social constraining which emerges in interaction with others to

internal cognitive constraints of the self (Vygotsky, 1978). The process of providing constraints for learning such that the novice gradually becomes able to self-constrain we call constraining.

Constraining refers to language and/or actions which emerge in relation to the organization of an interaction for knowledge acquisition. Constraining by an expert might include directing perceptual experience, orienting action, limiting stimuli and supplying verbal labels. Montessori (1967), in particular, spoke of optimizing environments for children by preparing the environment at a level that anticipates success. In this instance, the teacher facilitates student interactions with the environment not by interfering with the child's specific actions, but rather by providing particular objects and removing others. Here, class of target knowledge is constrained by the expert, but specific expression of knowledge is permitted many degrees of freedom. Other examples of social constraining include: Feurstein's (1980) discussion of expert-directed learning situations in which experts employ a repertoire of techniques to define the relevant dimensions of the environment for the novice, and Sigel and Cocking's (1977) taxonomy of parental-distancing strategies in which learning is facilitated by highlighting discrepancies between the child's knowledge and the child's environment.

Both teachers and students bring a range of particular expectations and responses to interaction. The extent to which there is a match between both the expectations and responses which each member brings to the relationship influences constraining in that relationship. Each member responds to the other through a particular interpretation of the other's expectations and

responses. Each individual's perceptions, representations, and actions are a joint function of those of the other member in interaction. However, it is not the case that the expert simply constrains the environment and the novice immediately learns. Rather, constraining may be more or less efficient and more or less effective. The extent of expert influenced learning by a novice depends on both the expert and the novice and the organization of their interaction.

To be efficient, adjustment through a range of potential actions by the expert is related to the differential responses of the novice. This is an emergent property of the expert-novice interactional system. By emergent we mean that the expert-novice interaction is neither expert-directed, nor novice-influenced, but is an emergent property of a particular interrelationship of individuals within situations and with particular demands and goals. Change in the degrees of freedom of target response is not determined by the expert, rather the organization emerges in expert-novice interaction. However, this is not meant to imply that a member of the interaction cannot become aware of the organization and influence it, nor that someone outside the interaction cannot become aware of and predict that organization. Rather, the properties of the interaction are not dependent either on reflection and influence or on classification and prediction. Each member exercises constraints in interaction and responds to the social constraining which characterizes the organization of that interaction.

An optimal mismatch between the knowledge of the novice and those knowledge potentialities preferred by the expert occurs when the direction of the target knowledge by the novice is not determined yet still occurs. An

example is found in Hunt's (1971) coordination of learner and environment characteristics for teaching. In his Conceptual Level Matching Model, he describes the structure of student personality (e.g., cognitive complexity, values, motivation and sensory orientation) and its relationship to appropriate training environment as a system which enables the student to move toward the next more complex level of thinking as a function of changes in training environment. For example, under this model a student who thinks in fixed terms of right and wrong is matched with a very structured learning situation which also involves recognition that context may influence judgement of right and wrong. In this way student perception is progressively directed from a known level of processing to a level which is more complex. In turn, students' actions are oriented away from a fixed pattern of response. In his study with Egeland and Hardt (Egeland, Hunt, & Hardt, 1970), increased academic gains were made by Upward Bound Students when student and training environment were matched.

Our characterization of teacher-student interaction as emerging, complementary, and dynamic processes emphasizes the importance of constraining in knowledge acquisition. Reconceptualizing interactions between teachers and students in terms of constraining enriches both research and instructional strategy. This approach refocuses attention away from one party or another to address the joint interaction of both individuals. As such, the formal relation between teacher and student is not obscured, which, in turn, enables us to more efficiently specify methods for optimizing the study of teaching and learning. The very complementarity of teacher-student organization suggests that processes of constraining include both differential constraining

and progressive empowerment and such complementarity needs to be addressed in any study of teaching-slash-learning.

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